



# REVIEW & UPDATE

## IN THE TREATMENT OF EPILEPSY

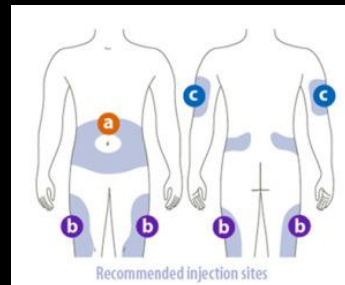
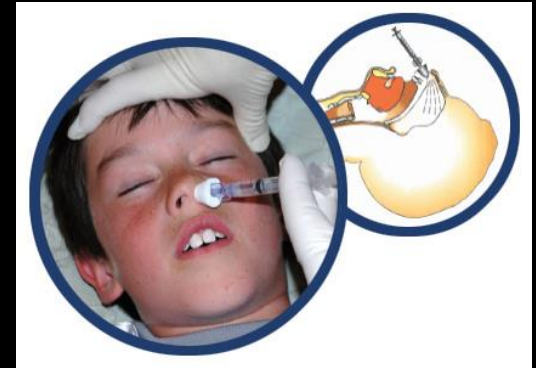
Steve Williams, Pharm.D.

DSHS – clinical pharmacist

UW – clinical professor

# TODAY'S TOPICS

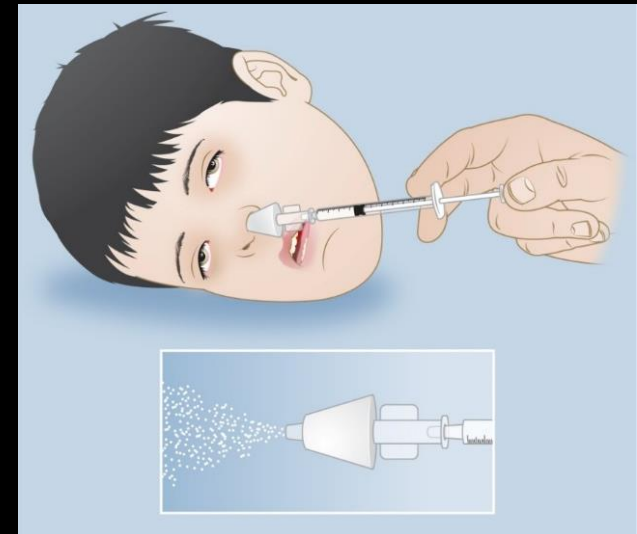
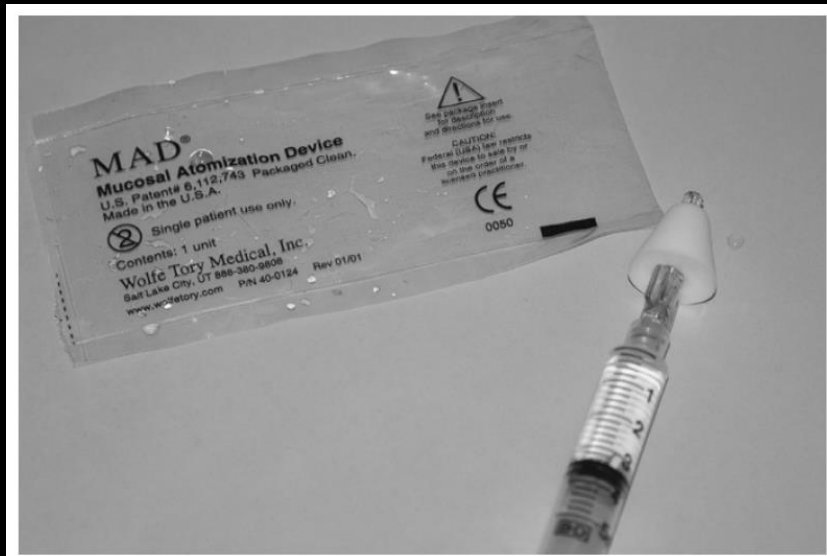
- **Rescue Treatment** of seizure > 5 min.
  - “time is brain”
  - Mortality rate
    - 2.6% 10-29 minutes
    - 19% > 30 minutes
- **New Antiepileptics**
  - Information
  - Warnings for antiepileptics
  - Warnings in general – “**black box**”
- **Vagal Nerve Stimulator**
- **Insulin technique**



# OVERVIEW OF NASAL DELIVER

- Seizures > 5 minutes – status epilepticus
  - midazolam, lorazepam
- Sedations
  - midazolam, lorazepam
- Pain Control
  - fentanyl
- Opiate overdose
  - naloxone









# Full Nasal Kit - Store in one place





Pull back syringe plunger until it has air filled to volume needed



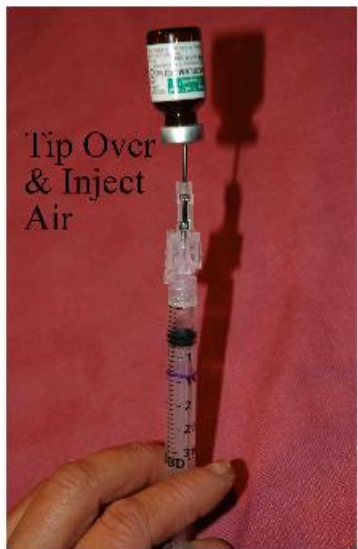
Pop Cap off



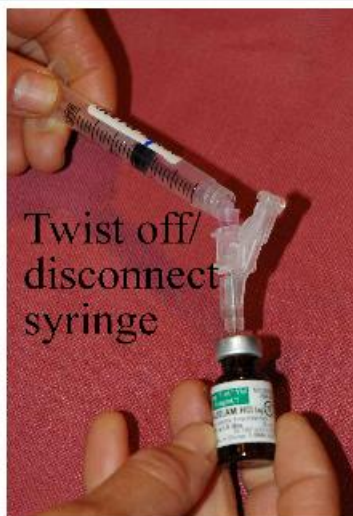
Puncture Rubber Seal



Tip Over & Inject Air



Twist off/  
disconnect  
syringe



Connect Atomizer



Connect tightly with  
twisting motion



# Seizure Therapy

**Lahat et al: Comparison of intranasal midazolam with intravenous diazepam for treating febrile seizures in children: prospective randomised study. *BMJ*, 2000**

- ◆ Prospective study: IN midazolam versus IV diazepam for prolonged seizures (>10 minutes) in children.
- ◆ Similar efficacy in stopping seizures (app. 90%).
- ◆ Time to seizure cessation:
  - ◆ IV Valium: 8.0 minutes.
  - ◆ IN Versed: 6.1 minutes.
- ◆ Conclusions: IN midazolam controls seizures more rapidly because there is no delay in establishing an IV.



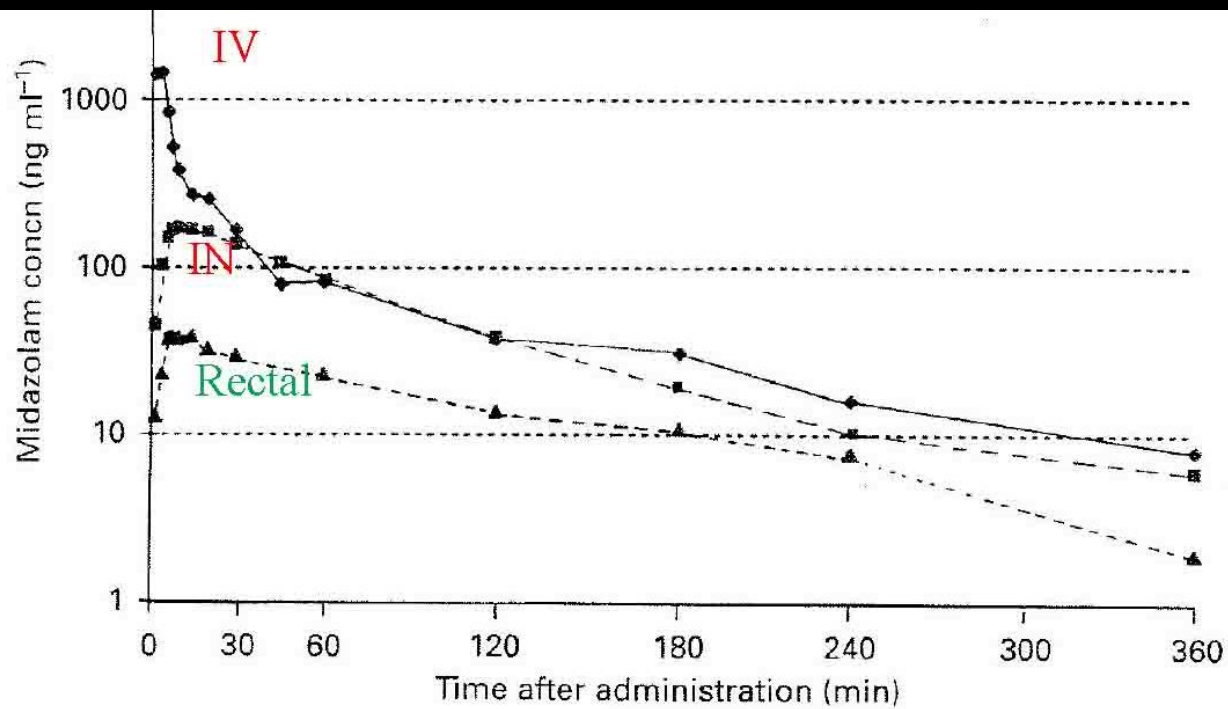
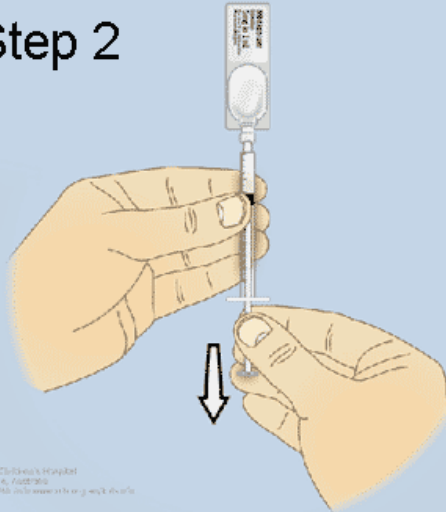


FIG. 1. Mean midazolam plasma concentration-time logarithmic curves after midazolam 0.2 mg kg<sup>-1</sup> in children.  
◆ = Group V (i.v.); ■ = group N (nasal); ▲ = group R (rectal).

## Step 2

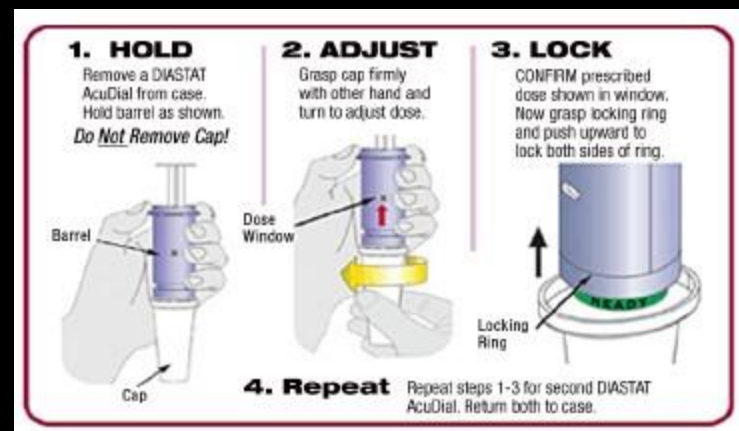


## Step 3



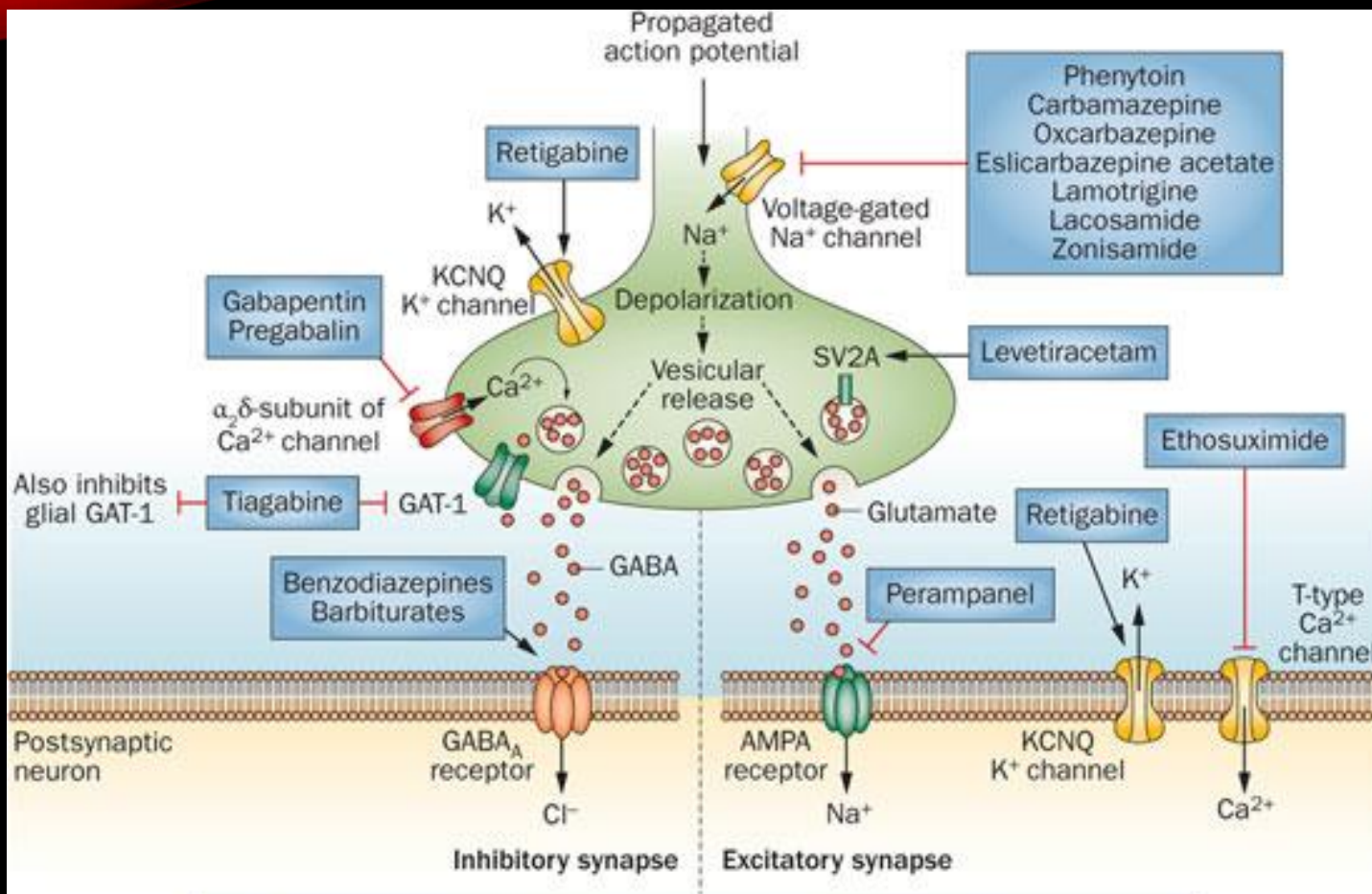






# NEW ANTIEPILEPTICS

• Perampanel	Fycompa	Oct 2012
• Clobazam	Onfi	Oct 2011
• Ezogabine	Potiga	Jun 2011
• Vigabatrin	Sabril	Aug 2009
• Rufinamide	Banzel	Nov 2008
• Lacosamide	Vimpat	Oct 2008



*Not illustrated:*

- Vigabatrin → ↓ GABA degradation
- and drugs with multiple mechanisms:
- Valproate → ↑ GABA turnover, ↓ Na<sup>+</sup> channels, ↓ NMDA receptors
- Topiramate → ↓ Na<sup>+</sup> channels, ↓ AMPA/kainate receptors, ↑ GABA<sub>A</sub> receptors
- Felbamate → ↓ Na<sup>+</sup> channels, ↑ GABA<sub>A</sub> receptors, ↓ NMDA receptors



# FDA: BLACK BOX

## **FYCOMPA may cause mental (psychiatric) problems, including:**

- new or worse aggressive behavior (including homicidal behavior), hostility, anger, anxiety, or irritability
- being suspicious or distrustful (believing things that are not true)
- other unusual or extreme changes in behavior or mood

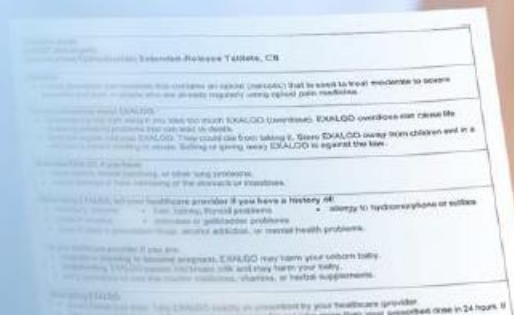
Tell your healthcare provider right away if you have any new or worsening mental problems while taking FYCOMPA.

## **Safety Announcement**

[04-26-2013] The U.S. Food and Drug Administration (FDA) is warning the public that the anti-seizure medication Potiga (ezogabine) can cause blue skin discoloration (See Photos) and eye abnormalities characterized by pigment changes in the retina. FDA does not currently know if these changes are reversible. All patients taking Potiga should have a baseline eye exam, followed by periodic eye exams. FDA is working with the manufacturer to gather and evaluate all available information to better understand these events. FDA will update the public when more information is available.

### **1. Permanent vision damage:**

SABRIL can damage the vision of anyone who takes it. The most noticeable loss is in your ability to see to the side when you look straight ahead (peripheral vision). If this happens, it will not get better. People who take SABRIL do not lose all of their vision, but some people can have severe loss particularly to their peripheral vision. With severe vision loss, you may only be able to see things straight in front of you (sometimes called "tunnel vision"). You may also have blurry vision.



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Drug Industry Daily

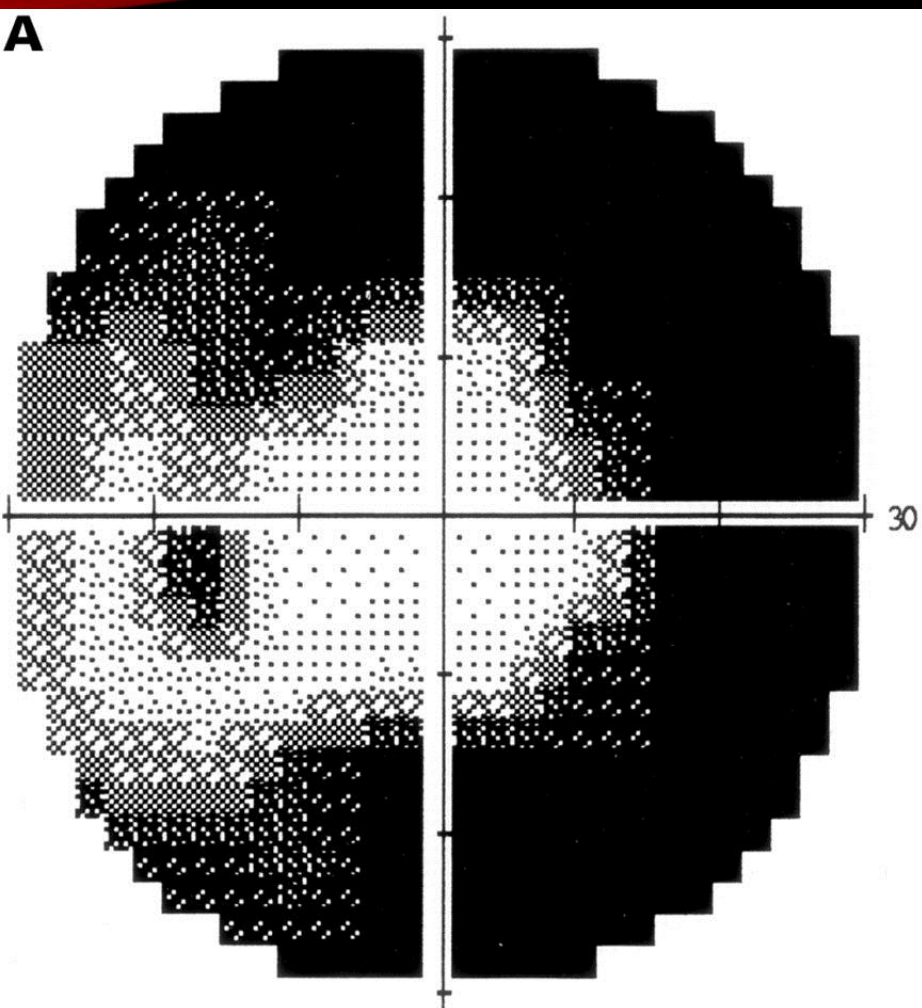
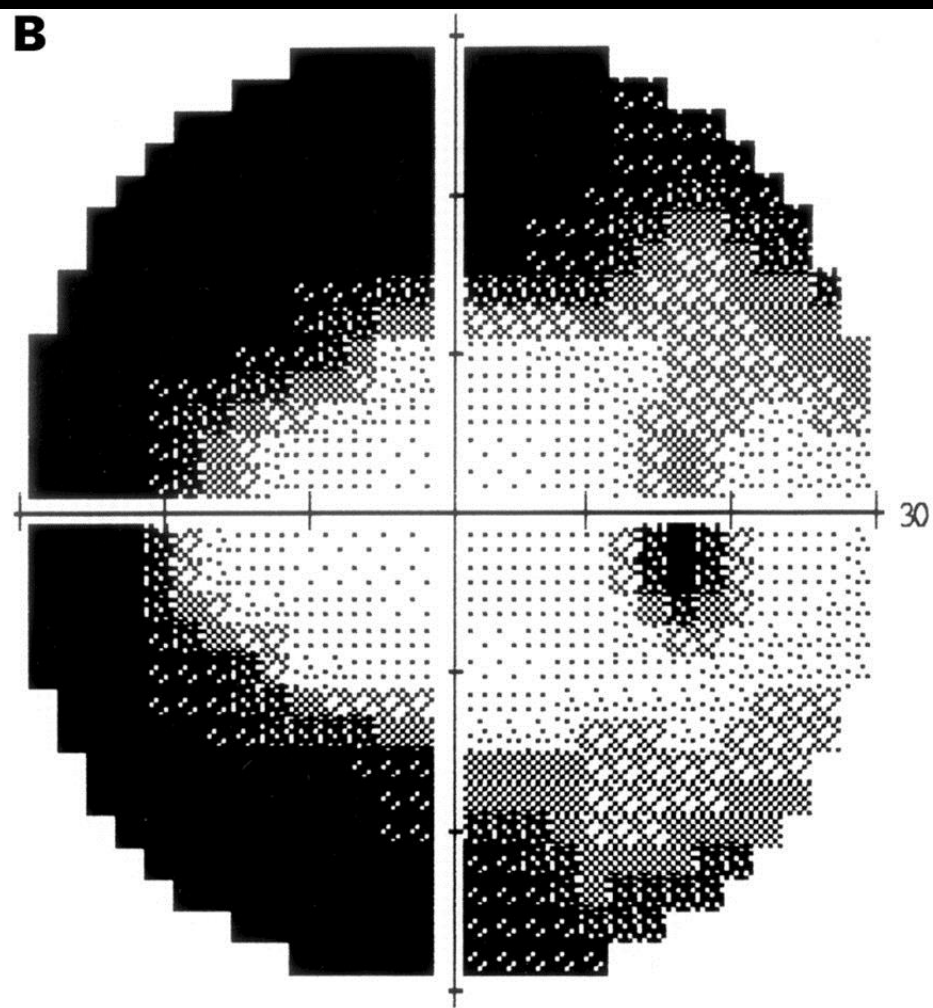
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The FDA has approved GlaxoSmithKline (GSK) and Valeant's seizure treatment Potiga, but will require a risk evaluation and mitigation strategy (REMS) and is recommending classification as a controlled substance.

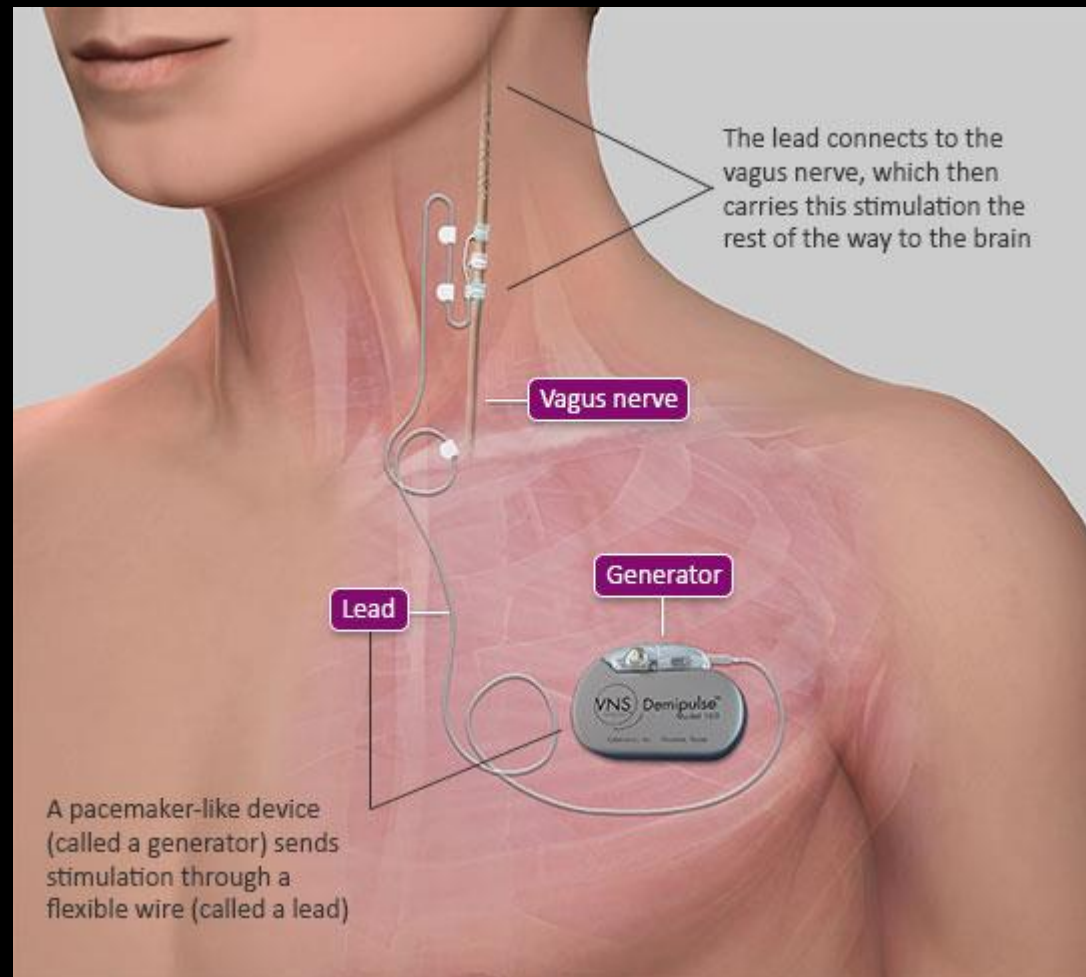
Discoloration AE - Lips

Medscape

Source: US Food and Drug Administration

**A****B**

# VAGAL NERVE STIMULATOR





# PRN – MAGNET

## USE TO STOP ANY SEIZURE





# WASH HANDS AND VERIFY INSULIN

- Thoroughly wash hands with soap and water. If appropriate, wear gloves.
- Always check the pen to make sure you're using the correct type of insulin.



WASH HANDS AND VERIFY INSULIN

# ATTACH NEEDLE AND PRIME

- Remove the paper tab from a new pen needle and screw onto pen clockwise.
- Select a dose of 2 units, remove the outer cap from the pen needle (save this for later) and the inner needle cap (through this away).
- Hold the pen with the needle pointing upward and tap insulin window so any air bubbles rise to the needle.
- Press injection button all the way. Insulin should come out of the needle (in either a stream or as drops). If insulin doesn't come out, check for air bubbles and repeat the test two more times. If still no insulin, try a new needle.





ATTACH NEEDLE AND PRIME

# ATTACH NEEDLE AND PRIME

**This is a very important step. Attach needle carefully and be sure to prime before every dose. Bent needles or air bubbles are very common sources of inadequate insulin doses**

# SELECT DOSE AND INJECTION SITE

- Be sure the dose marker is at 0 after priming the pen.
- Dial the pen to the appropriate dose for this patient.
- Select an appropriate site for injecting the insulin.  
Abdomen is preferred (back of upper arm, buttocks, thigh).



# SELECT DOSE AND INJECTION SITE





# INJECT THE DOSE

- Clean area of injection with an alcohol swab.
- Pinch a one inch fold of skin gently.
- Insert needle at a 90° angle.
- Release pinched skin and press the injection button in all the way, until all insulin is injected.
- Leave the needle in place and slowly count to 10 to prevent the insulin from leaking out of injection spot.
- Withdraw the needle straight out of the skin.

The image features a solid black background. At the top, there is a decorative, wavy border with a color gradient. From left to right, the colors transition from a warm orange-red to a bright yellow, then through green, and finally to a light blue on the far right. The text "INJECT THE DOSE" is positioned in the upper right area of the black field.

INJECT THE DOSE



# INJECT THE DOSE

**If any insulin comes out of the injection site after removing the needle, leave the needle in the skin for longer before removing it at the next insulin dose.**



# DISPOSE OF THE NEEDLE

- Replace the outer needle cap and twist the needle counter-clockwise to remove it.
- Dispose of the used needle in a sharps container.





# DISPOSE OF THE NEEDLE

**A sharps container should be available. Use it.**